IN THE CLAIMS:

Please amend the claims as follows:

1. (Currently Amended) A method ~~for performing channel equalization in a receiver,~~ comprising: ~~in which~~

receiving a signal ~~is received~~ from a communication channel, the signal containing symbols formed of binary information by phase shift keying; ~~,~~

performing channel estimation ~~is performed~~ to estimate the properties of the communication channel; ~~, and~~

taking samples ~~are taken~~ of the received signal at intervals; ~~, characterized in that in the method,~~

examining a determined number of samples; ~~are examined,~~

performing a computation of bit decisions ~~a decision step is taken, in which~~, to find out transmitted symbols, ~~bit decisions are computed~~ on the basis of said determined number of samples, and

after each computation of bit decisions ~~step~~, examining computed bit decisions to determine whether said computation of bit decisions ~~step~~ is to be iterated,

wherein upon iteration of said computation of bit decisions ~~step~~, using at least some of the bit decisions of the previous computation of bit decisions ~~step are used~~ in addition to the samples under examination, in the computation of the bit decision.

2. (Currently Amended) The method according to claim 1, ~~characterized in that~~ further comprising: for performing said computation of bit decisions ~~step~~, a cost function ~~is defined~~ is used wherein

$$f(B) = \frac{1}{2}\sum_{t=0}^{T}\left(\left\| r_t - \sum_{s=0}^{H-1} h_s S(B_{t-s})\right\|^2 - \sum_{s=0}^{H-1} \overline{h}_s h_s \overline{S}(B_{t-s}) S(B_{t-s}) + \sum_{k=1}^{M}\left(b_{t,k} - \frac{1}{2}\right)^2\right),$$

in which *S(B)* is the symbol corresponding to bits B, h_s are the estimated channel coefficients, and *r* is the received signal which is sampled, and that said cost function *(f(B))* is subjected to minimization.

3. (Currently Amended) The method according to claim 2, ~~characterized in that in the method,~~ wherein to minimize said cost function, said computation of bit decisions ~~step~~ is iterated, and ~~in which the~~ an update rule

$$b_{l,k}(j+1) = f_h\left(\sum_{t=l}^{l+H-1} re\left\{\bar{r}_t h_{t-l}\frac{\Delta S(B_l)}{\Delta b_{l,k}}\right\} - re\left\{\bar{h}_{t-l}\frac{\Delta \bar{S}(B_l)}{\Delta b_{l,k}}\sum_{q=0,t-q\neq l}^{H-1} h_q S(B_{t-q})\right\}\right),$$

is used, where $B_l = \lfloor b_{l,1}, b_{l,2}, \ldots, b_{l,M} \rfloor$ is *M* bits at the moment $l = u + l\Delta u$, $S(B_l)$ is the corresponding symbol, $\frac{\Delta S\ (B_l)}{\Delta b_{l,k}}$ is a derivative with respect to *k* bits, *h* indicates the communication channel, of which *H* channel taps are estimated, and $f_h(x)$ is a hard limit function which receives the value 1, if $x > 0$, else 0.

4. (Currently amended) The method according to claim ~~1, 2 or~~ 3, ~~characterized in that~~ wherein in the update rule, noise is added before taking said computation of bit decisions ~~step~~.

5. (Currently Amended) A receiver comprising

- ~~means (4) for receiving~~ a receiver configured to receive a signal from a communication channel, the signal containing symbols ~~($S(B_l)$)~~ formed of binary information by phase shift keying,
- a channel estimator ~~(17) for estimating~~ configured to estimate the properties of the communication channel,
- a channel equalizer [[(7)]], and
- a samplermeans ~~(5, 15a-15d) for sampling~~ configured to sample the received signal at intervals,

characterized in that the channel equalizer [[(7)]] comprises ~~means (16a-16c)~~ computing units ~~for examining~~ configured to examine a number of samples defined at the time, ~~decision means (18a-~~

~~18c)~~ iteration blocks ~~for computing~~ configured to compute bit decisions [[(*B*)]] on the basis of said ~~defined~~ number of samples to find out transmitted symbols ~~($S(B_l)$)~~, and examining ~~means~~ block ~~(11) for estimating the need for iterating the computation of the bit decisions (B)~~ configured to examine computed bit decisions to determine whether said computation of bit decisions is to be iterated, wherein upon iterating said computation of bit decisions [[(B)]], said computing units are configured to use at least some of ~~the~~previous bit decisions ~~of the previous decision step are arranged to be used~~ in addition to the samples under examination at the time.

6. (Currently Amended) The receiver according to claim 5, ~~characterized in that~~ wherein for computing said bit decisions [[(*B*)]], the channel equalizer is configured to~~receiver comprises means (16a-16c) for~~ minimize~~ing~~ the cost function

$$f(B)=\frac{1}{2}\sum_{t=0}^{T}\left(\left\|r_t-\sum_{s=0}^{H-1}h_s S(B_{t-s})\right\|^2-\sum_{s=0}^{H-1}\overline{h}_s h_s \overline{S}(B_{t-s})S(B_{t-s})+\sum_{k=1}^{M}\left(b_{t,k}-\frac{1}{2}\right)^2\right),$$

in which *S(B)* is the symbol corresponding to bits B, h_s are the estimated channel coefficients, and *r* is the received signal which is sampled.

7. (Currently Amended) The receiver according to claim 6, **characterized** in that the iteration blocks are configured to~~decision means comprise means (18a-18c) for~~ compute~~ing~~ an update rule

$$b_{l,k}(j+1)=f_h\left(\sum_{t=l}^{l+H-1} re\left\{\overline{r}_t h_{t-l}\frac{\Delta S(B_l)}{\Delta b_{l,k}}\right\}-re\left\{\overline{h}_{t-l}\frac{\Delta\overline{S}(B_l)}{\Delta b_{l,k}}\sum_{q=0,t-q\neq l}^{H-1}h_q S(B_{t-q})\right\}\right)$$

where $B_l=\lfloor b_{l,1},b_{l,2},\ldots,b_{l,M}\rfloor$ is *M* bits at the moment $l=u+l\Delta u$, $S(B_l)$ is the corresponding symbol, $\frac{\Delta S\ (B_l)}{\Delta b_{l,k}}$ is a derivative with respect to *k* bits, *h* indicates the communication channel, of which *H* channel taps are estimated, and $f_h(x)$ is a hard limit function which receives the value 1, if $x > 0$, else 0.

8. (Currently Amended) The receiver according to claim 7, **characterized** in that it ~~comprises~~ said computing units ~~(16a-16c), each of which~~ are ~~arranged~~ configured to determine one symbol value on the basis of said defined number of samples, that the output of each computing unit ~~(16a-16c)~~ is coupled to the input of at least one other computing unit ~~(16a-16c)~~, for using the symbol values defined by the computing units ~~(16a-16c)~~ in the next computation of the bit decision.

9. (Previously Presented) The receiver according to claim 8, **characterized** in that each computing unit ~~(16a-16c)~~ contains as many iteration blocks ~~(18a, 18b, 18c)~~ as the bit number of symbols formed in [[the]] a modulation.

10. (Currently Amended) The receiver according to claim 5 ~~any of the claims 5 to 8~~, **characterized** in that the computing units ~~means for examining the number of samples determined each time~~ comprise a delay line ~~(15a-15d)~~ in which the number of delays is one less than the number of symbols ~~($S(B_i)$)~~ to be determined from said defined number of samples.

11. (Currently Amended) The receiver according to claim 7 ~~any of the claims 5 to 10~~, **characterized** in that it comprises a noise generator~~means [[*n*]]~~ for adding noise in the update rule before computing said bit decisions.

12. (Currently Amended) The receiver according to claim 5 ~~any of the claims 5 to 11~~, **characterized** in that it is configured to ~~comprises means (11) for~~ setting an initial value for the bits before computing said bit decisions.

13. (Currently Amended) A channel equalizer ~~(7)~~ comprising

a sampler ~~means (5, 15a-15d) for sampling~~ configured to sample a signal received from a communication channel at intervals, which received signal contains symbols ~~($S(B_i)$)~~ formed of binary information by phase shift keying, and which received signal has been subjected to channel estimation for estimating the properties of the communication channel, ~~**characterized** in that the channel equalizer comprises~~

computing units ~~means (16a-16c) for examining~~ configured to examine a number of samples defined at a time,

iteration blocks ~~decision means (18a-18c) for computing~~ configured to compute bit decisions ~~(*B*)~~ on the basis of said ~~defined~~ number of samples to find out [[the]] transmitted symbols ~~($S(B_i)$)~~, and

examining ~~means~~ block ~~(11) for estimating the need for iterating the computation of the bit decisions (*B*)~~ configured to examine computed bit decisions to determine whether said computation of bit decisions is to be iterated, wherein upon iterating said computation of bit decisions ~~(*B*)~~, said computing units are configured to use at least some of ~~the~~previous bit decisions ~~of the previous decision step are arranged to be used~~ in addition to the samples under examination at the time.

14. (Currently Amended) A wireless communication device comprising

- ~~means (4)~~ a receiver ~~for receiving~~ configured to receive a signal from a communication channel, the signal containing symbols ~~($S(B_i)$)~~ formed of binary information by phase shift keying,
- a channel estimator ~~(17)~~ ~~for estimating~~ configured to estimate the properties of the communication channel,
- a channel equalizer ~~(7)~~, and
- ~~means (5, 15a-15d)~~ a sampler ~~for sampling~~ configured to sample the received signal at intervals,

~~characterized in that~~ wherein the channel equalizer ~~(7)~~ comprises

computing units ~~means (16a-16c) for examining~~ configured to examine a number of samples defined at the time,

~~decision means (18a-18c)~~iteration blocks ~~for computing~~ configured to compute bit decisions ~~(*B*)~~ on the basis of said ~~defined~~ number of samples to find out [[the]] transmitted symbols ~~($S(B_i)$)~~, and

examining ~~means~~ block~~(11) for estimating the need for iterating the computation of the bit decisions (*B*)~~ configured to examine computed bit decisions to determine whether said computation of bit decisions is to be iterated, wherein upon iterating said computation of bit decisions ~~(*B*)~~, computing units arrange at least some of ~~the~~ previous bit decisions ~~of the previous decision step are arranged~~ to be used in addition to the samples under examination at the time.

15. (New) A receiver comprising

- means for receiving a signal from a communication channel, the signal containing symbols formed of binary information by phase shift keying,
- a channel estimator for estimating the properties of the communication channel,
- a channel equalizer, and
- means for sampling the received signal at intervals,

wherein the channel equalizer comprises means for examining a number of samples defined at the time, decision means for computing bit decisions on the basis of said number of samples to find out transmitted symbols, and examining means for estimating the need for iterating the computation of the bit decisions, wherein upon iterating said computation of bit decisions, at least some of the bit decisions previously computed are arranged to be used in addition to the samples under examination at the time.

16. (New) A wireless communication device comprising

- means for receiving a signal from a communication channel, the signal containing symbols formed of binary information by phase shift keying,
- a channel estimator for estimating the properties of the communication channel,
- a channel equalizer, and
- means for sampling the received signal at intervals,

wherein the channel equalizer comprises means for examining a number of samples defined at the time, decision means for computing bit decisions on the basis of said number of samples to find out transmitted symbols, and examining means for estimating the need for iterating the computation of bit decisions by examining computed bit decisions to determine whether said computation of bit decisions is to be iterated, wherein upon iterating said computation of bit decisions, said decision means are configured to use at least some of previous bit decisions in addition to the samples under examination at the time.

17. (New) The receiver of claim 15, wherein an update rule is used, and wherein noise is added in the update rule before taking said computation of bit decisions.

18. (New) The wireless communication device of claim 16, wherein an update rule is used, and wherein noise is added in the update rule before taking said computation of bit decisions.